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RANGE IMPROVEMENT



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NOTES

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STATEMENT OF PURPOSE

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This publication is printed primarily to inform professional range administrators of important range improvement and management developments and findings. These "Notes" may include extracts of published papers, unpublished preliminary reports of research work, unpublished reports on administrative studies, and personal observations or suggestions of other range administrators. No claim is made as to the accuracy or completeness of studies or conclusions drawn.

All who read these RANGE IMPROVEMENT NOTES are encouraged to submit material for publication, or suggestions for improving its usefulness. Full credit will be given for any material used.

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RANGE MANAGEMENT NOW FULL-TIME VOCATION

(Article by Dr. John Vallentine ^{1/}
appearing in the June 1960 issue
of the Utah Cattleman)

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Range management as a separate science is of recent origin. It was developed in western United States only since the turn of the century. Its development was made necessary by the need for concentrating existing information and "know-how" upon the animal-plant-soil complex encountered in range livestock production.

Many problems encountered by the pioneer livestock grazer in the plains, desert and mountain grazing regions of the West were entirely different from those encountered in the eastern states or in Europe. These problems could not be readily answered by experience in other areas, and mistakes were made. Effective research programs to solve the problems had to await the development of a new science to serve as a framework within which to operate. Thus, it has only been in recent years that a backlog of information has been developed on such important items as grazing capacity, grazing systems to encourage better livestock distribution, range seeding and brush control methods, the nutritive value, productivity, and palatability of various range forage plants.

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The word "range" refers to large blocks of non-cultivated lands supporting native vegetation. These lands are commonly unfenced and found in low rainfall areas. We also speak of non-irrigated areas seeded to long-lived, semi-permanent grasses as rangeland. The word "pasture" is used commonly as a synonym for range, although pasture originally referred more strictly to small-fenced, and intensively managed grazing grounds. However, any real difference has largely disappeared because of the need to improve the supply and utilization of range forage through cultural practices such as fencing, water development, and seeding and through more intensive management of the grazing animal.

Maximum Production

Range management involves obtaining maximum, sustained livestock production from range lands. If a definition of this science does not mention livestock grazing as a primary goal, it is grossly inadequate and incomplete. However, livestock grazing must be managed so that the soil does not erode and so that other land interests are not destroyed. Conservation and multiple use of range land is of utmost importance. Conservation does not mean non-use, since in only a minority of areas is complete restriction from grazing necessary or desirable. Conservation should be given a working definition of "managed use."

Range management is closely related to, and largely developed from, animal husbandry, agronomy, veterinary science, agricultural economics and range ecology. Range technicians cooperate with animal husbandmen

in analyzing the nutritive value of range plants and the need for supplemental feeding of range livestock, in livestock handling methods, in ways of improving percent calf crop, and alternative types of ranch operation. Range researchers cooperate with veterinarians in determining ways of preventing poisonous plant losses and improving general livestock health.

Range researchers cooperate with agronomists in evaluating methods of reseeding grasses, in controlling undesirable range plants, and in stabilizing soil erosion. Cooperative efforts with agricultural economists yield information on size of economic units, livestock marketing, economic returns from range management practices for improvement, and yearlong planning of ranch operations. By means of cooperative efforts with plant ecologists and physiologists, studies are made of range condition and trend, plant succession, grazing tolerance of range plants and proper season of use on different ranges.

Ancient Art

Range management, as an art, is not new but had its origins in ancient times. From the beginning of time, livestock graziers have had to make range management decisions. Because of its association with the "whittling" away of their permits for grazing livestock on public lands, many ranchers have regarded range management as only a basis for regulations of land use. However, range management principles and research results are basic tools which every rancher should use in the

management of his ranch. The rancher who is not basically a good range manager is headed for eventual failure regardless of whether he operates primarily on public or private lands.

To stay in the range livestock business today, economic pressures make it necessary for range operations to be on a scientific basis. We can learn much from the boom and bust period following the Civil War. During this period, little attention was given to such present-day considerations as efficient size of ranch units, proper grazing intensity, good livestock distribution, proper supplementation and care of the range stock, and preparation for drought and winter emergencies. Thus, when the great drought and severe winters of 1885-87 came upon the scene, ranchers were caught unprepared, and losses in range livestock were tremendous and many ranchers went broke. Today, in the period of reduced profit margins and agricultural surpluses, we must emphasize efficiency over total production.

It is commonly stated that the four principles of range management are: 1) proper season of use; 2) proper kinds or kind of livestock; 3) good distribution of the grazing animals; and 4) proper livestock numbers. Reducing livestock numbers is only one of many alternatives available in obtaining proper range use. Maximum utilization may be made of grazing lands, but the use must be consistent with maintaining or improving the state of health and productivity of a range at a high level. Range operations must be planned and managed so that range

will be just as productive, if not more productive, 50 or 100 years from now. To do otherwise, is not only to use the interest from our ranges, but actually to make serious inroads upon the principal. Any banker can warn against that practice. In general, we should take half and leave half of the forage on our ranges each year.

Grass Farmers

The basic resource of the rancher is his soil, which must be kept in place on his range land and in a productive state. The basic crop is not the livestock or game animals, but the forage crop itself. Ranchers in reality are "grass" farmers and market their products -- grass and other range forage -- through the cattle and sheep they raise. The beef, mutton and wool produced on our ranges are the marketable end products.

A common phrase today among the ranchers is that "conformation is what an individual animal appears to be, his pedigree is what he should be; but his performance is what he actually is." This also has meaning when applied to range land. A hasty, superficial sighting across the range does not tell its actual productivity.

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ALL THAT IS GREEN IS NOT FORAGE

By Bill K. Cooperrider
Editor - RANGE IMPROVEMENT NOTES

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The misbelief that all forage-producing lands are suitable for livestock grazing has been a major contributor to extensive range and watershed depletion. Wildfire, poor farming practices, uncontrolled logging and mining activities, and poorly engineered roads have also damaged the land and caused silted reservoirs, floods, poor functioning watersheds and loss of the basic soil resource. However, none of these activities have had such far reaching effects as the grazing of lands not adapted or suitable for grazing use.

When management of livestock on rough, mountainous lands is designed to harvest all forage-producing areas, invariably excessive use is made of the more accessible and easily herded range. If this heavy impact is continued for a period of years, forage production on these more accessible areas is decreased and livestock in turn are forced more and more to feed the less accessible range. These lands are commonly steep and characterized by relatively thin unstable soils. Frequently soil stability is in a delicate balance even without the impact of grazing. When this balance is disturbed and the impact added to that of the heavily used accessible range, we clearly see the fallacy of believing that all forage-producing lands can be safely grazed.

Where is the breaking point? How much of a mountainous range-watershed can be grazed safely? Experience and study have helped answer some of these questions. Grazing use must be limited to those forage-producing areas which can be grazed on a sustained yield basis without damaging the basic soil resource under an attainable system of management. Essentially this is a definition of the suitable range. However, it takes training, experience, judgment and on-the-ground measurements to accurately separate the suitable from the unsuitable. Some areas are on the "fringe" and can only be used very lightly every second or third year. Others may be adaptable for use only under a rotational system. Still others may be in such depleted condition as to require temporary closure to permit natural or artificial rehabilitation. Management must be designed and tailored to fit the particular characteristics of each suitable range area.

All that is green is not forage.

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PREINOCULATED ALFALFA SEED NOW AVAILABLE

(Excerpts from a news release
from Northrup, King & Co.)

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NOCULIZED^{1/} alfalfa seed, the specially treated seed that is pre-inoculated with live, nitrogen-fixing bacteria strains before it is bagged, is now available.

The NOCULIZED process, which was first introduced last year in the Midwest only, is a wholly new concept in seed inoculation. Through a special agreement, nine of the nation's major seed firms will be processing NOCULIZED seed. The seed firms are installing machinery which will apply the process to their quality alfalfa seed. In addition to the nine processors, a number of seed companies have been licensed to merchandise NOCULIZED seed.

This important research development involves four basic steps. First, quality alfalfa seed meeting NOCULIZED specifications is selected. Then a liquid suspension of selected bacteria strains is applied to each seed. Next, a vacuum is created which forces these bacteria inside the seed where they live for many months. Finally, the seed is bagged, ready for distribution and use. Samples of each lot treated are submitted for periodic "grow out" tests to insure maintenance of quality.

^{1/} Trademark

By eliminating the need for inoculating seed just before planting, the process will save valuable time and effort. It also means more evenly and effectively inoculated alfalfa seed because the seed is preinoculated under controlled conditions.

Agricultural leaders have long recognized the value of properly inoculating legumes with *Rhizobia* bacteria. These bacteria fix nitrogen from the air in forms which can be used by the plant. This essential nitrogen stimulates plant growth and helps build and maintain high soil productivity.

The exact amount of nitrogen fixed by bacteria in alfalfa plants varies, but it has been estimated that they may add 120 pounds or more of nitrogen to each acre. Some of this nitrogen is used by the alfalfa plants but most of it is left in the soil for succeeding crops.

Inoculating seed with bacteria has been a problem. Bacteria die within a few hours after they are applied to seed by usual methods and the wet, lumpy inoculated seed often clogs the planter. These difficulties combined with the inconvenience of old methods has meant that many legume plantings have either been poorly inoculated or, because of the bother, not inoculated at all.

Recognizing this problem researchers began work in 1950 for a more effective method of inoculation — one which would more nearly insure uniform inoculation of entire alfalfa stands. In its final form this patented process is based on the principle of placing nitrogen-fixing bacteria inside the

seed coat where they are protected from environmental changes. Tests have shown that under proper storage conditions, the bacteria within the seed survive the five- to six-month period necessary to take care of a season's use.

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A good listener is not only popular everywhere,
but after a while he knows something.

-- Wilson Mizner

HOW TEMPERATURE AFFECTS RANGE SEEDING

(From Agricultural Research, a
monthly publication by the Agricultural
Research Service, USDA)

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Because of low and erratic rainfall on the range, the main concern in seeding is usually adequate soil moisture. But germinating seeds have temperature as well as moisture requirements. A recent study of six range grasses showed that, within fairly broad limits, seed germination was reduced more by unfavorable temperature than by low moisture.

ARS range conservationist W. J. McGinnies at the Colorado Agricultural Experiment Station, Fort Collins, made the germination tests, using three temperatures and six levels of moisture stress. Moisture stress -- the resistance to movement of water into plants -- increases with decreasing water concentration. When soil moisture is low, moisture stress is high.

The tests showed that as moisture stress increased, germination was delayed and reduced. But as long as the temperature was favorable, seeds germinated fairly well even under relatively high levels of moisture stress. The grasses tested, all cool-season species, were Nordan crested wheatgrass, Greenar intermediate wheatgrass, Topar pubescent wheatgrass, Whitmar beardless wheatgrass, Lincoln smooth brome, and Russian wild-rye. Under high moisture stress, all six germinated better at a test temperature of 68° F. than at 50° or 86° F. Beardless wheatgrass and Russian

wildrye -- more difficult to establish under range conditions than the other four grasses -- showed the least adaptability to different temperatures and levels of moisture stress.

Range must still be seeded at times when soil moisture is available, but we can direct future efforts into ways to make the temperature more favorable for germination. For instance, if moisture is available only during warm periods, it may be possible to keep the soil cooler by using a mulch, a tall stubble, or deep furrow drilling. When the temperature is too low, planting only on exposures that get the most sun may be the answer.

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The only people with whom you should try
to get even are those who have helped you.

(Designed by Axel Dale Peterson
U. S. Forest Service)



